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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,583	03/31/2004	Janne T. Nurminen	874.0120.U1(US)	9392

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EXAMINER	
ANDUJAR, LEONARDO	
ART UNIT	**PAPER NUMBER**
2826	

DATE MAILED: 03/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/815,583	NURMINEN, JANNE T.	
	Examiner	Art Unit	
	Leonardo Andújar	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *31 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4,8-10,12,13,15,17 and 18* is/are rejected.

7)☒ Claim(s) *2,5-7,11,14 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3, 4, 8-10, 12, 13, 15, 17 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Carter et al. (US 5,594,234).

3. Regarding claim 1, Cater (e.g. figs. 7 and 11) shows an integrated circuit package comprising: a substrate 84 having a first surface and a second surface (e.g. fig. 11): a first die pad area 41, disposed on said first surface, said die pad area having dimensions suitable to mount an integrated circuit 83 thereon (see fig. 11); a plurality of thermally conductive signal elements disposed on the first surface of the substrate outside the die pad area, comprising a first signal pad row 41b and at least one additional signal pad row 41c; and a first plurality of thermally conductive thermal fingers 41a extending from said die pad area and thermally coupled thereto, said thermal fingers encompassing at least some individual ones of the pads of the first signal pad row.

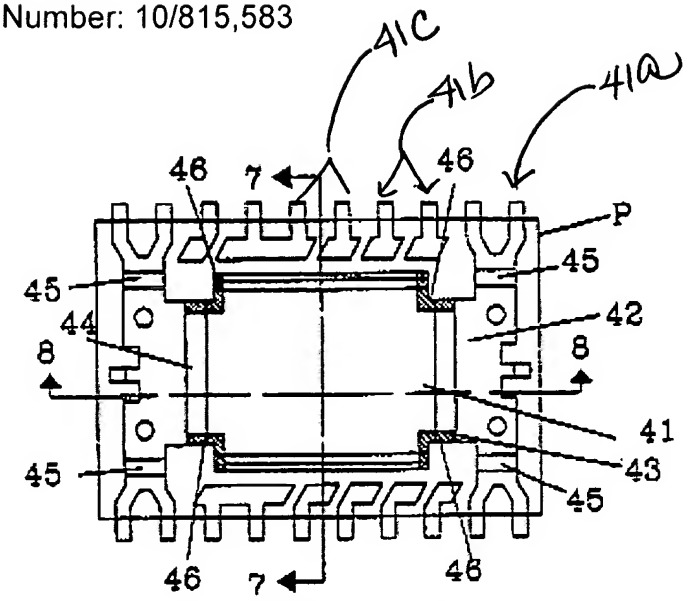

FIGURE 7

4. Regarding claim 3, Carter (e.g. fig. 11) shows a plurality of vias 85, one or more of the vias coupled (i.e. thermally) to an associated signal element 81, the one or more vias providing at least thermal conductivity form the surface of the substrate to the second surface of the substrate. Note that there is a thermal path between both elements via the encapsulant and via the substrate

5. Regarding claim 4, Carter (e.g. fig. 11) shows that said a second surface comprises a substantially continuous layer 88 of thermally conductive material underlying said first die pad area and said first plurality of thermally conductive thermal fingers.

6. Regarding claim 8, Carter (e.g. fig. 11) shows an integrated circuit 83 disposed on the die pad area.

7. Regarding claim 9, Carter (e.g. fig. 11) shows that thermal fingers are thermally coupled to a plurality of electrical signal conveying vias 85 disposed between the first and second surfaces. Note that there is a thermal path via the encapsulant and via the substrate.

8. Regarding claim 10, Carter (e.g. fig. 7 and 11) shows an integrated circuit package comprising: a substrate 84 having a first surface and a second surface (e.g. fig. 11): a first die pad area 41, disposed on said first surface, said die pad area having dimensions suitable to mount an integrated circuit 83 thereon; a plurality of thermally conductive signal elements 41b/c disposed on the first surface of the substrate surrounding the die pad area, comprising a first signal pad row 41b and at least one additional signal pad row 41c; where an outer edge of said die pad area is formed to comprise a plurality of relief structures 41a, where at least some individual ones of said relief structures at least partially surround at least one of said signal pads of said first signal pad row.

9. Regarding claim 12, Carter shows a substantially continuous layer 88 of thermally conductive material underlying said first die pad area and said first plurality of relief structures.

10. Regarding claim 13, Carter (e.g. .g. fig. 7 and 11) shows a method for dissipating thermal energy from a die pad comprising: providing a substrate 84 having a first surface and a second surface and a first thermally conductive die pad 82 disposed on said first surface, said die pad comprising a first plurality of relief structures 41a formed on an outer edge, where at least some individual ones of said relief structures at least partially surround at least one signal pad 41 of a first signal pad row 41b on said first surface and are thermally coupled thereto; and conveying thermal energy using a plurality of thermally conductive vias 85 coupled (i.e. thermally) to said signal pads 81,

for providing thermal conductivity from the first surface of the substrate to the second surface of the substrate.

11. Regarding claim 15, Carter shows a substantially continuous layer 88 of thermally conductive material underlying said first die pad area and said first plurality of relief structures.

12. Regarding claim 17, Carter shows an integrated circuit 83 on the die pad.

13. Regarding claim 18, Carter shows that the plurality of thermally conductive.

Allowable Subject Matter

14. Claims 2, 5-7, 11, 14 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonardo Andújar whose telephone number is 571-272-1912. The examiner can normally be reached on Mon through Thu from 9:00 AM to 7:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Leonardo Andujar
Primary Examiner
Art Unit 2826